SulTRAC

September 30, 2019

Mr. Nabil Fayoumi
Work Assignment Manager
U.S. Environmental Protection Agency (EPA)
77 W. Jackson Blvd. – 6th Floor
Chicago, IL 60604

Subject: **Submittal of Supplemental Investigation Report**
State Route 71 Right-of-Way (ROW)
Ottawa Radiation Areas, Operable Unit 4 (OU4), NPL-8 Frontage Property
LaSalle County, Illinois
Remedial Action Contract (RAC) 2
Contract No. EP-S5-06-02, Work Assignment No. 334-RARA-059Z

Dear Mr. Fayoumi:

SulTRAC is submitting an electronic (pdf) copy of the Supplemental Investigation Report, NPL-8 Frontage Property regarding additional soil boring investigation activities completed in the Illinois State Route 71 right-of-way. The enclosed electronic files include all appendices and attachments.

If you have any questions regarding this submittal, please call me at (312) 201-7788.

Sincerely,

Jack Brunner
SulTRAC Project Manager

Enclosure

cc: Pankaj Parikh, EPA Project Officer (letter only)
Daniel Olsson, EPA Contract Officer (letter only)
Mindy Gould, SulTRAC Program Manager (letter only)
Kelly Horn, Illinois Emergency Management Agency (IEMA)
Kelly Grahn, IEMA
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ATTACHMENT

SUPPLEMENTAL INVESTIGATION REPORT
STATE ROUTE 71 RIGHT-OF-WAY
OTTAWA RADIATION AREAS
OPERABLE UNIT 4
NPL-8 FRONTAGE PROPERTY
LASALLE COUNTY, ILLINOIS

SUPPLEMENTAL INVESTIGATION REPORT
ROUTE 71 RIGHT-OF-WAY
OTTAWA RADIATION AREAS
OPERABLE UNIT 4
NPL-8 FRONTAGE PROPERTY
LASALLE COUNTY, ILLINOIS
SEPTEMBER 2019

SulTRAC prepared this supplemental investigation report to present the results of soil boring and sampling activities conducted on September 11 through 13, 2019, as part of a supplemental investigation of the State Route (SR) 71 right-of-way (ROW) immediately southeast of Ottawa Radiation Areas (ORA) Operable Unit 4, NPL-8 Frontage Property, in LaSalle County, Illinois. SulTRAC prepared this report under the U.S. Environmental Protection Agency (EPA) Remedial Action Contract (RAC) II for Region 5, Contract No. EP-S5-06-02, Work Assignment (WA) No. 334-RARA-059Z.

During the currently ongoing NPL-8 Frontage Property remedial action (RA), the extent of contamination observed in the Area HS-2 excavation area exceeded the previously identified extent. Due to the presence of known and previously unknown utilities in the expanded excavation area and utility protection measures that would be required to continue excavation, this supplemental investigation was conducted to more accurately delineate the extent of contamination and determine if other underground utilities exist in the ROW.

Supplemental investigation activities, including sample handling procedures, laboratory analytical methods, decontamination procedures, investigation-derived waste disposal, and quality assurance and quality control requirements were conducted in accordance with the 2019 Sampling and Analysis Plan (SAP) Addendum, Supplemental Investigation Activities (SulTRAC 2019a). The supplemental investigation background and objectives, sampling activities, sampling results, and conclusions based on the investigation results are presented below. References cited in this report are listed after the text of the report. The table and figures cited in the text follow the references.

Investigation Background and Objectives

A gamma walkover field screening survey occurred at the NPL-8 Frontage Property in June 2018, including the ROW. The survey indicated elevated counts per minute (cpm) of radiation, with measurements exceeding 6,500 cpm in the ROW within Areas HS-2 and HS-4. Results appear on Figure 1.

During the currently ongoing NPL-8 Frontage Property remedial action (RA), radiological contamination had been detected at the bottom (approximately 8 feet below ground surface [bgs]) and along the northwest and southeast walls (about 7.5 feet bgs) of the Area HS-2 excavation. As part of RA excavation activities in Area HS-2, samples had been collected for field gamma spectroscopy analysis at the following locations:

- The excavation floor (sample L8-Floor-Spot-2 at 8 feet bgs, where 12,500 cpm had been detected).
- The northwest wall of the excavation under the AT&T fiber optic line (sample L8-NW-W-1 at 7.5 feet bgs, where 7,700 cpm had been detected).
- The southeast wall of the excavation under the Nicor Gas 12-inch gas main (sample L8-SE-W-1 at 7.5 feet bgs, where 7,500 cpm had been detected).

Total radium concentrations in those samples reported by the on-site laboratory were as follows:

- Sample L8-Floor-Spot-2: 33.44 picocuries per gram (pCi/g);
- Sample L8-NW-W-1: 11.92 pCi/g; and
- Sample L8-SE-W-1: 11.33 pCi/g.

Excavation activities did not extend deeper because benching and sloping could not be safely conducted with utilities in the area. Additionally, excavation under the fiber optic line or gas main was not feasible without proper engineering controls in place to prevent undermining the utilities.

Therefore, this supplemental soil boring investigation occurred in the ROW that met the following project objectives: (1) assist in guiding remaining RA activities in the ROW through the use of data from down-hole gamma logging and data from soil samples analyzed at the on-site laboratory, and (2) obtain additional information to determine whether the depth of contamination extends beyond 10 feet bgs and whether contamination laterally extends significantly beyond Areas HS-2 and HS-4.

Investigation Activities

Activities conducted during this supplemental investigation included the installation of soil borings, down-hole gamma logging, soil sampling, air monitoring, and demobilization procedures. These activities are presented below.

Soil Borings

SulTRAC subcontracted CS Drilling to advance a total of 18 soil borings in the SR-71 ROW, applying direct-push technology (DPT) and hand augering methods to a maximum depth of approximately 12 feet bgs at the locations shown on Figure 2. Of the 18 soil borings advanced, 15 were installed in proximity of observed contamination within Area HS-2 and the presumed contamination extending toward and within Area HS-4. In addition, following review of down-hole gamma logging results, three step-out soil borings were advanced at other locations to assist in further delineation of the lateral extent of contamination.

Before the soil borings were advanced, SulTRAC had completed a one-call dig notification as required in the EPA-approved 2019 Site Management Plan (SulTRAC 2019b). Additionally, CS Drilling subcontracted Ground Penetrating Radar Systems (GPRS), a private utility locating company, to confirm utility locations using ground penetrating radar (GPR). Utilities within the ROW were identified and marked accordingly, and are shown on Figure 2. Identified utilities included an AT&T communications line; an electrical line (marked by GPRS); three fiber optic lines owned, respectively, by AT&T, Illinois Fiber, and MediaCom; and two unknown utility lines (marked by GPRS). The one fiber optic line previously uncovered during excavation in Area HS-2 was at approximately 5 feet bgs.

SulTRAC also confirmed with Nicor Gas that an active 12-inch, high-pressure gas main and a presumed inactive 10-inch gas main were present. The 10-inch gas main had previously not been identified. Nicor Gas advised SulTRAC to assume the 10-inch gas main active because Nicor Gas had no information regarding abandonment of this main. A Nicor Gas representative was also on site to observe soil boring activities in the vicinity of the gas main, and granted CS Drilling special permission to drill within 3 feet of the high-pressure gas main during this investigation. Figure 2 shows locations of the gas mains and other utilities as delineated in the field, along with their proximities to the installed soil borings and current HS-2 and proposed HS-4 excavation areas. The high-pressure gas main was observed at approximately 7 feet bgs in the SR-71 ROW. The inactive gas service line was observed at about 2 to 3 feet bgs in the same vicinity as the high-pressure gas main.

Soil borings were advanced by DPT methods, and continuous soil cores were collected using a Macro-Core® sampler and acetate sleeves. SulTRAC conducted sampling activities per the approved SAP Addendum and as discussed below.

Down-Hole Gamma Logging and Soil Sampling Activities

SulTRAC and Stan A. Huber Consultants, Inc. (SAHCI) personnel conducted down-hole gamma logging at each boring location to identify potential anomalies of elevated cpm readings within each boring, and to aid in the selection of step-out boring locations.

To perform down-hole gamma logging, CS Drilling installed a 1-inch inner diameter polyvinyl chloride (PVC) pipe with a capped end within each boring after advancing to terminal depth. Down-hole gamma logging measurements were collected using a Ludlum Model 2221 Scaler/Ratemeter (Serial No. 127242) with attached unshielded Ludlum Model 44-62 ½-inch sodium iodide (NaI) Detector (Serial No. PR129795). This instrument was calibrated on December 11, 2018, using traceable EPA calibration drums at EPA facilities in Willowbrook, Illinois. The calibration drums contain concentrations of thorium ranging from 1.7 pCi/g to 23.4 pCi/g. A count rate threshold of 3,308 cpm was calculated to indicate a count rate equivalent to 7.1 pCi/g of total thorium (Th-230+Th-232). Similar drums for calibrating down hole logging equipment for total radium (Ra-226+Ra-228) are not available at EPA. However, the thorium calibration drums have radium and other decay products in equilibrium and would be similarly effective for determining a radium count rate threshold. The count rate threshold indicative of 6.2 pCi/g total radium can be calculated at 3,072 cpm using the same linear regression formula. The site-specific remedial action objective is 6.2 pCi/g of radium-226 in soil. A count rate threshold for total radium represents a conservative estimate of radium-226 concentrations.

Gamma radiation levels (in cpm) in each borehole were recorded at time intervals of 1 minute at each 0.5- foot depth interval down to the maximum depth of each borehole. Down-hole gamma logs are presented in Appendix A.

Following retrieval of the sampler and acetate sleeves from each borehole, soil cores were examined for lithology, and characteristics of the soil (e.g., color, grain size, density or hardness, plasticity, and an approximation of moisture content) were recorded on a boring log. Soil boring logs are presented in Appendix B.

After soil cores had been examined, each 2-foot depth interval of soil was collected and homogenized within a plastic gallon zipper bag. Following homogenization, a minimum of two 20-milliliter (mL) sample volumes of soil were placed in plastic vials, labeled in accordance with the SAP, and transported to the on-site field laboratory for field gamma spectroscopy analysis. The two 20-mL sample volumes per 2-foot depth interval were analyzed separately, and then the resulting concentrations were averaged to determine total radium concentration. No samples were collected for off-site laboratory analysis. Where soil borings were advanced to the target depth of 12 feet bgs, six soil samples were collected for field gamma spectroscopy analysis at each soil boring location—one from each 2-foot depth interval (0 to 2, 2 to 4, 4 to 6, 6 to 8, 8 to 10, and 10 to 12 feet bgs). At borings encountering refusal at shallower depths, fewer samples were collected.

Air Monitoring

Perimeter air monitoring associated with ongoing RA activities at the NPL-8 Frontage Property continued with no disruptions. No additional investigation-specific perimeter air monitoring occurred, as dust generation was minimal during soil boring, down-hole logging, and sampling activities.

Demobilization Procedures

Soil cuttings and other potentially contaminated investigation-derived waste were containerized and temporarily staged in a secure conex box at the NPL-8 Frontage Property site for eventual placement on the constructed contaminated soil stock pile on the NPL-8 Landfill or off-site disposal, as appropriate.

Following completion of sampling and down-hole gamma logging at boreholes, CS Drilling personnel sealed boreholes flush to the ground surface using bentonite chips and granules, and appropriately restored the area. All equipment was decontaminated and screened for contamination before release from the site in accordance with the SAP.

Soil Sampling and Down-hole Gamma Logging Results

SulTRAC analyzed a total of 205 soil samples for total radium using the EPA-approved field gamma spectroscopy. The field gamma spectroscopy and corresponding down-hole gamma survey results are presented in Table 1 and presented with their associated borings in Figure 3. The results indicate that four 2-foot composite soil samples from one of the 18 soil borings (SB10) advanced in Grid G7 contained total radium at concentrations above the site-specific remedial action objective (RAO) of 6.2 pCi/g for radium-226. These four samples had been collected within the intervals of 0 to 2, 2 to 4, 4 to 6, and 6 to 8 feet bgs. Elevated down-hole gamma survey results were also observed at these depths within SB10, with a maximum reading of 4,669 cpm at 6.5 feet bgs. Field laboratory results for total radium from these four samples are as follows:

- Sample NPL8-ROW-SB-10-0002: 6.90 pCi/g;
- Sample NPL8-ROW-SB-10-0204: 8.31 pCi/g;
- Sample NPL8-ROW-SB-10-0406: 11.22 pCi/g; and
- Sample NPL8-ROW-SB-10-0608: 9.13 pCi/g.

No other result from 2-foot composite samples analyzed via field gamma spectroscopy exceeded the RAO of 6.2 pCi/g. However, as discussed below, down-hole gamma logging at several borings yielded detections exceeding 3,072 cpm within various 6-inch intervals.

Selection of three step-out soil boring locations was based on results from both the down-hole gamma survey and 2-foot composite soil samples in which total radium concentrations approached the site-specific RAO of 6.2 pCi/g for radium-226. Maximum counts detected during down-hole gamma surveys at soil borings SB05, SB06, and SB15 were 3,885 cpm (at 1.5 feet bgs), 3,279 cpm (at 1 foot bgs), and 3,350 cpm (at 1 foot bgs), respectively. The step-out boring for SB15 was placed approximately 10 feet to the southwest. The step-out borings for SB05 and SB06 were placed approximately 20 feet to the southeast; this increased step-out distance for these two borings was necessary due to the location of an unknown utility and the clean soil stockpiles.

Down-hole gamma survey readings at the step-out borings did not exceed 3,072 cpm. However, field gamma spectroscopy analysis of the 2-foot composite sample collected from 8-10 feet bgs from the step-out soil boring for SB-05 yielded a radium concentration of 9.3 pCi/g; the cpm range for this 2-foot interval was 1,399 to 1,758 cpm. To determine whether this discrepancy was an anomaly, SulTRAC collected a second set of five aliquots from this 2-foot composite sample. These aliquots were then analyzed separately by the on-site field laboratory via field gamma spectroscopy, with results indicating an average radium concentration of 3.70 pCi/g. This result was consistent with the down-hole gamma results for step-out boring SB05-S01 from 8-10 feet bgs, which indicated that no exceedances of the gamma threshold were present. Therefore, the initial result was likely an anomaly.

SB14 yielded a maximum count reading of 4,432 cpm at 1.5 feet bgs; however, results from nearby borings SB13 and SB15 precluded the need for a step-out boring in this area. Also, no additional step-out boring from SB10 was advanced because of suitable coverage from nearby borings SB09 and SB11; numerous subsurface utilities were also present in the immediate area. Similarly, a count reading of 3,280 cpm at 2 feet bgs was noted at SB07; however, spatial restrictions due to the adjacent NPL-8 Frontage Property fence to the northwest and the presence of buried utilities prevented the advancement of a step-out boring from this location. No other gamma results exceeded the count rate threshold of 3,072 cpm.

Conclusions

Down-hole gamma logging readings indicated that surficial concentrations of radium in soil above the RAO may be present within 0-2 feet bgs in the vicinity of borings SB05, SB06, SB07, SB14, and SB15. However, sample analytical results from 2-foot composite samples collected at these soil borings did not indicate radium-226 contamination exceeding the RAO of 6.2 pCi/g. Similar contamination has been observed in the 0 to 2 feet bgs depth interval in the current HS-2 excavation area. Therefore, the elevated gamma results are expected to be associated with soil contamination above the site-specific RAO. Based on these results and observations in the current HS-2 excavation, only shallow excavation to a maximum depth of about 2.5 feet bgs will likely be required to meet the RAO in these areas.

Down-hole gamma logging results were less than 3,072 cpm at soil borings SB01 and SB03 in the vicinity of the HS-2 excavation area in Grid L8. Composite soil sample results from SB01 and SB03 also did not exceed the RAO. Excavation at the HS-2 initial excavation area has been advanced to the depth of the Nicor Gas main. Therefore, additional RA excavation in this area may not be necessary. However, additional manual excavation may be conducted to remove soil from the floor of the excavation containing radium-226 above the RAO.

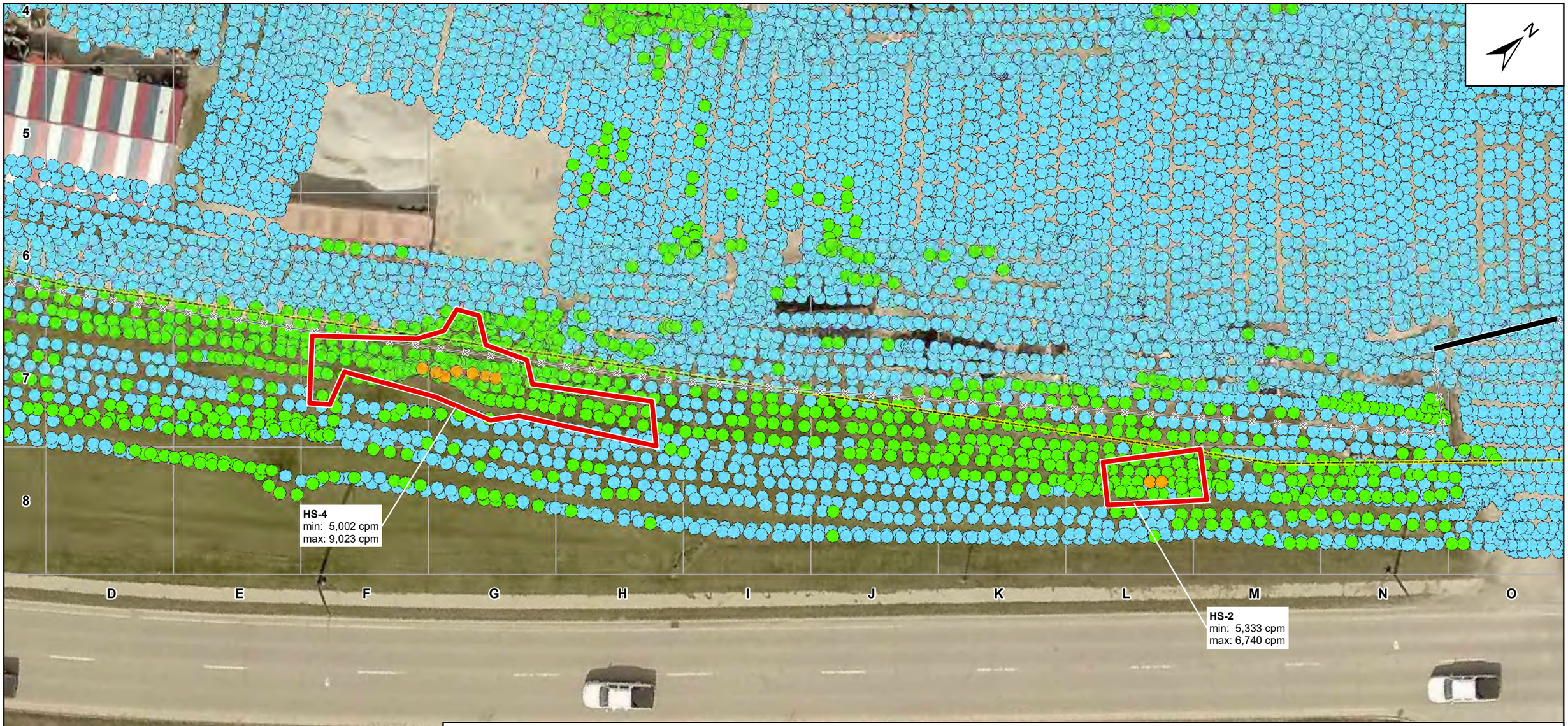
Down-hole gamma logging and sample results from the 2-foot composite samples collected at step-out soil borings SB05-S01, SB06-01, and SB15-01 did not indicate concentrations of radium exceeding the RAO. Therefore, these results indicate that contamination does not extend laterally beyond these or other initial borings advanced during the investigation.

Based on analytical results from samples collected at boring SB10 and activities during the supplemental investigation, radium-226 contamination at concentrations above the RAO was determined to extend laterally less than 10 feet beyond the eastern boundary of the proposed excavation for Area HS-4 within Grid G7 to about 8 feet bgs (see Figure 3). Elevated cpm readings from down-hole gamma logging at SB10 corroborated the on-site laboratory results. Based on these results, excavation to address elevated contamination in the vicinity of SB10 may be necessary down to 8 feet bgs. However, given the presence of the Nicor gas main and service main, as well as the existing fiber optic line, excavation to this depth will likely not be feasible without engineering controls to support the Nicor gas main. The presence of fiber optic lines in this area would further complicate excavation activities.

References

SulTRAC. 2019a. "Sampling and Analysis Plan Addendum, Supplemental Investigation Activities, State Route 71 Right-of-Way, Ottawa Radiation Areas (ORA), Operable Unit 4. NPL-8 Frontage Property, Operable Unit 4, in LaSalle County, Illinois." September 10.

SulTRAC. 2019b. "Site Management Plan, Ottawa Radiation Areas (ORA), Operable Unit 4. NPL-8 Frontage Property, Operable Unit 4, in LaSalle County, Illinois." June.



Legend

Gamma Survey

- 0 - 3,000 cpm (Gamma Survey - below 6" shielded background)
- 3,000 - 6,500 cpm
- 6,500 - 10,000 cpm
- > 10,000 cpm

cpm = counts per minute

- Hot Spot Area
- Existing Gate Location
- Proposed Gate Location
- Fence Location
- Frontage Property Boundary
- 33' x 33' Grid
- **A0** Reference Grid Number

0 20 40
Feet

Source: Bing Map-GIS online map server

DESIGNED:	K. SCHNOES
DRAWN:	M.BANH
PROJECT NO.	103G18521334
DATE:	AUGUST 2019

SulTRAC

STATE ROUTE 71 RIGHT-OF-WAY
NPL-8 FRONTAGE PROPERTY SITE
OTTAWA, ILLINOIS
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

SCALES:
HORIZONTAL SCALE: AS SHOWN
VERTICAL SCALE: N/A

FIGURE 1
GAMMA WALKOVER SURVEY RESULTS
06/25/2018 and 06/28/2018

9/10/2019 G:\G\1852\197 Ottawa Radiation - RA\mxd\2019-08 NPL8 Gamma Survey\Fig1-NPL8-GammaWalkoverSurvey-ROW.mxd m.banh

4
5
6
7
8
C
D
E
F
G
H
I
J
K
L
M
N
O

Area B
Area B-Extended
G4-Extended
G3
G4
HS-4
HS-2
HS-2-Extended
SB01
SB02
SB03
SB04
SB05
SB06
SB07
SB08
SB09
SB10
SB11
SB12
SB13
SB14
SB15
SB15-S01
SB06-S01
SB05-S01

Legend

- Soil Boring Locations
- Soil Boring Step Out
- Actual Excavation Area
- Proposed Excavation Area
- A0 Reference Grid Number
- AT&T Communications Line
- Electrical Line - identified by GPRS private locate
- Fiber Optic Line - AT&T, iFiber (Illinois Fiber), and MediaCom
- Nicor Gas Main and Nicor Service Line
- Unknown Utility - identified by GPRS private locate
- Existing Gate Location
- Fence Location
- Frontage Property Boundary
- 33' x 33' Grid

Note:
Three additional contingency step out borings were installed based on results in the field.

0 20 40
Feet

Source: Bing Map-GIS online map server

DESIGNED:	K. SCHNOES
DRAWN:	A.PRESTRIDGE
PROJECT NO.	103G18521334
DATE:	SEPTEMBER 2019

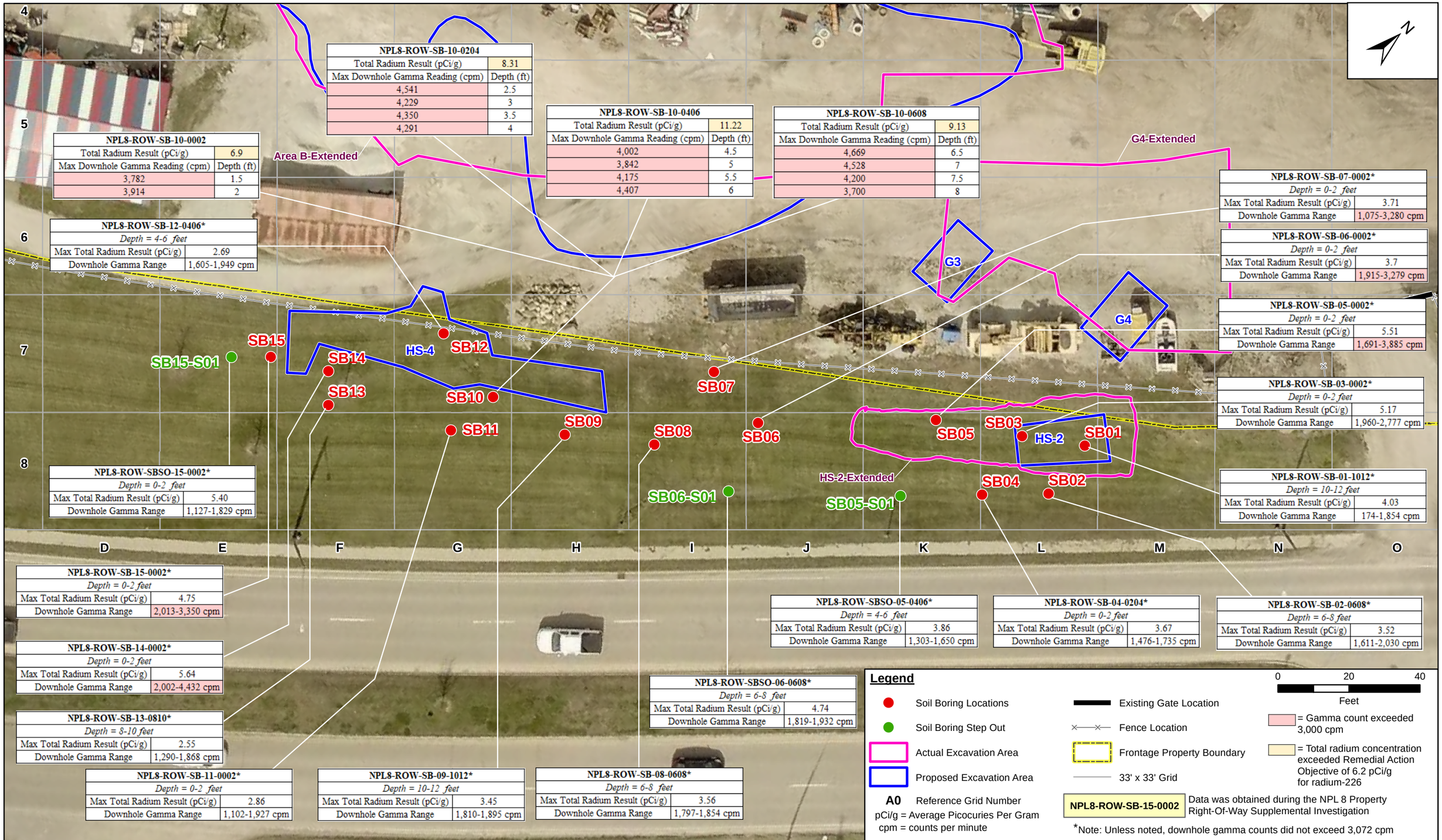
SulTRAC

STATE ROUTE 71 RIGHT-OF-WAY
NPL-8 FRONTAGE PROPERTY SITE
OTTAWA, ILLINOIS
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

SCALES:
HORIZONTAL SCALE: AS SHOWN
VERTICAL SCALE: N/A

FIGURE 2
MARKED UTILITIES AND FINAL SOIL BORING LOCATIONS

9/19/2019 G:\G\1852\197 Ottawa Radiation - RA\mxd\2019-09 NPL8\Fig3-PropSB-ROW.mxd m.banh



NPL8-ROW-SB-10-0204	
Total Radium Result (pCi/g)	8.31
Max Downhole Gamma Reading (cpm)	Depth (ft)
4,541	2.5
4,229	3
4,350	3.5
4,291	4

NPL8-ROW-SB-10-0406	
Total Radium Result (pCi/g)	11.22
Max Downhole Gamma Reading (cpm)	Depth (ft)
4,002	4.5
3,842	5
4,175	5.5
4,407	6

NPL8-ROW-SB-10-0608	
Total Radium Result (pCi/g)	9.13
Max Downhole Gamma Reading (cpm)	Depth (ft)
4,669	6.5
4,528	7
4,200	7.5
3,700	8

NPL8-ROW-SB-10-0002	
Total Radium Result (pCi/g)	6.9
Max Downhole Gamma Reading (cpm)	Depth (ft)
3,782	1.5
3,914	2

NPL8-ROW-SB-12-0406*	
Depth = 4-6 feet	
Max Total Radium Result (pCi/g)	2.69
Downhole Gamma Range	1,605-1,949 cpm

NPL8-ROW-SB-07-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	3.71
Downhole Gamma Range	1,075-3,280 cpm

NPL8-ROW-SB-06-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	3.7
Downhole Gamma Range	1,915-3,279 cpm

NPL8-ROW-SB-05-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	5.51
Downhole Gamma Range	1,691-3,885 cpm

NPL8-ROW-SB-03-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	5.17
Downhole Gamma Range	1,960-2,777 cpm

NPL8-ROW-SB-01-1012*	
Depth = 10-12 feet	
Max Total Radium Result (pCi/g)	4.03
Downhole Gamma Range	174-1,854 cpm

NPL8-ROW-SBSO-15-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	5.40
Downhole Gamma Range	1,127-1,829 cpm

NPL8-ROW-SB-15-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	4.75
Downhole Gamma Range	2,013-3,350 cpm

NPL8-ROW-SB-14-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	5.64
Downhole Gamma Range	2,002-4,432 cpm

NPL8-ROW-SB-13-0810*	
Depth = 8-10 feet	
Max Total Radium Result (pCi/g)	2.55
Downhole Gamma Range	1,290-1,868 cpm

NPL8-ROW-SB-11-0002*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	2.86
Downhole Gamma Range	1,102-1,927 cpm

NPL8-ROW-SB-09-1012*	
Depth = 10-12 feet	
Max Total Radium Result (pCi/g)	3.45
Downhole Gamma Range	1,810-1,895 cpm

NPL8-ROW-SB-08-0608*	
Depth = 6-8 feet	
Max Total Radium Result (pCi/g)	3.56
Downhole Gamma Range	1,797-1,854 cpm

NPL8-ROW-SBSO-06-0608*	
Depth = 6-8 feet	
Max Total Radium Result (pCi/g)	4.74
Downhole Gamma Range	1,819-1,932 cpm

NPL8-ROW-SBSO-05-0406*	
Depth = 4-6 feet	
Max Total Radium Result (pCi/g)	3.86
Downhole Gamma Range	1,303-1,650 cpm

NPL8-ROW-SB-04-0204*	
Depth = 0-2 feet	
Max Total Radium Result (pCi/g)	3.67
Downhole Gamma Range	1,476-1,735 cpm

NPL8-ROW-SB-02-0608*	
Depth = 6-8 feet	
Max Total Radium Result (pCi/g)	3.52
Downhole Gamma Range	1,611-2,030 cpm

Legend

- Soil Boring Locations
- Soil Boring Step Out
- Actual Excavation Area
- Proposed Excavation Area
- A0 Reference Grid Number
- Existing Gate Location
- Fence Location
- Frontage Property Boundary
- 33' x 33' Grid
- = Gamma count exceeded 3,000 cpm
- = Total radium concentration exceeded Remedial Action Objective of 6.2 pCi/g for radium-226

0 20 40 Feet

pCi/g = Average Picocuries Per Gram
cpm = counts per minute

NPL8-ROW-SB-15-0002 Data was obtained during the NPL 8 Property Right-Of-Way Supplemental Investigation

*Note: Unless noted, downhole gamma counts did not exceed 3,072 cpm

Source: Bing Map-GIS online map server

DESIGNED:	K. SCHNOES
DRAWN:	A.PRESTRIDGE
PROJECT NO.	103G18521334
DATE:	SEPTEMBER 2019

SulTRAC

STATE ROUTE 71 RIGHT-OF-WAY
NPL-8 FRONTAGE PROPERTY SITE
OTTAWA, ILLINOIS
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

SCALES:
HORIZONTAL SCALE: AS SHOWN
VERTICAL SCALE: N/A

FIGURE 3
FIELD GAMMA SPECTROSCOPY AND DOWN-HOLE GAMMA SURVEY RESULTS

9/30/2019 G:\G\1852\197 Ottawa Radiation - RA\mxd\2019-09 NPL8\Fig4-PropSB-ROW.mxd m.banh

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-01-0810	09/12/19	8.5	2,113	3.35
		9.0	2,069	
		9.5	1,945	
		10.0	1,759	
NPL8-ROW-SB-01-1012	09/12/19	10.5	1,744	4.03
		11.0	1,781	
		11.5	1,854	
		12.0	1,578	
NPL8-ROW-SB-02-0002	09/11/19	0.5	1,152	2.18
		1.0	1,447	
		1.5	1,469	
		2.0	1,611	
NPL8-ROW-SB-02-0204	09/11/19	2.5	1,600	3.10
		3.0	1,747	
		3.5	1,859	
		4.0	1,940	
NPL8-ROW-SB-02-0406	09/11/19	4.5	1,911	3.24
		5.0	1,976	
		5.5	1,770	
		6.0	1,760	
NPL8-ROW-SB-02-0608	09/11/19	6.5	1,623	3.52
		7.0	1,611	
		7.5	1,784	
		8.0	2,030	
NPL8-ROW-SB-02-0810.5	09/11/19	8.5	2,140	3.13
		9.0	1,956	
		9.5	1,784	
		10.0	1,602	
		10.5	1,474	
NPL8-ROW-SB-03-0002	09/11/19	0.5	2,777	5.17
		1.0	2,288	
		1.5	2,105	
		2.0	1,960	
NPL8-ROW-SB-03-0204	09/11/19	2.5	1,654	2.13
		3.0	1,750	
		3.5	1,608	
		4.0	2,011	
NPL8-ROW-SB-03-0406	09/11/19	4.5	1,942	3.84
		5.0	2,001	
		5.5	2,057	
		6.0	2,053	
NPL8-ROW-SB-03-0607.3	09/11/19	6.5	2,033	3.64
		7.0	2,041	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-04-0002	09/11/19	0.5	1,093	1.20
		1.0	1,193	
		1.5	1,280	
		2.0	1,425	
NPL8-ROW-SB-04-0204	09/11/19	2.5	1,476	3.67
		3.0	1,519	
		3.5	1,591	
		4.0	1,735	
NPL8-ROW-SB-04-0406	09/11/19	4.5	1,890	3.21
		5.0	1,847	
		5.5	1,859	
		6.0	1,812	
NPL8-ROW-SB-04-0608	09/11/19	6.5	1,689	2.82
		7.0	2,052	
		7.5	1,894	
		8.0	1,662	
NPL8-ROW-SB-04-0810	09/11/19	8.5	1,805	2.48
		9.0	1,807	
		9.5	1,804	
		10.0	1,737	
NPL8-ROW-SB-04-1012	09/11/19	10.5	1,896	3.07
		11.0	1,835	
		11.5	1,855	
		12.0	1,358	
NPL8-ROW-SB-05-0002	09/11/19	0.5	1,691	5.51
		1.0	2,770	
		1.5	**3,885**	
		2.0	2,697	
NPL8-ROW-SB-05-0204	09/11/19	2.5	2,258	4.01
		3.0	2,198	
		3.5	2,182	
		4.0	2,079	
NPL8-ROW-SB-05-0406	09/11/19	4.5	2,172	2.65
		5.0	2,137	
		5.5	2,075	
		6.0	1,997	
NPL8-ROW-SB-05-0608	09/11/19	6.5	1,934	3.23
		7.0	2,084	
		7.5	2,070	
		8.0	2,063	
NPL8-ROW-SB-05-0810	09/11/19	8.5	2,126	3.40
		9.0	2,055	
		9.5	2,146	
		10.0	2,110	
NPL8-ROW-SB-05-1011.5	09/11/19	10.5	2,124	3.16
		11.0	2,074	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-06-0002	09/11/19	0.5	1,915	3.70
		1.0	**3,279**	
		1.5	2,775	
		2.0	2,129	
NPL8-ROW-SB-06-0204	09/11/19	2.5	2,066	2.60
		3.0	2,104	
		3.5	2,174	
		4.0	2,127	
NPL8-ROW-SB-06-0406	09/11/19	4.5	2,031	2.33
		5.0	1,828	
		5.5	1,827	
		6.0	1,857	
NPL8-ROW-SB-06-0608	09/11/19	6.5	1,829	2.87
		7.0	1,855	
		7.5	1,946	
		8.0	1,983	
NPL8-ROW-SB-06-0810	09/11/19	8.5	1,993	2.37
		9.0	2,071	
		9.5	2,014	
		10.0	1,844	
NPL8-ROW-SB-06-1012	09/11/19	10.5	1,757	2.89
		11.0	1,906	
		11.5	1,878	
		12.0	1,931	
NPL8-ROW-SB-07-0002	09/11/19	0.5	1,075	3.71
		1.0	1,412	
		1.5	2,118	
		2.0	**3,280**	
NPL8-ROW-SB-07-0204	09/11/19	2.5	2,896	2.60
		3.0	2,366	
		3.5	2,048	
		4.0	2,007	
NPL8-ROW-SB-07-0406	09/11/19	4.5	1,966	2.33
		5.0	2,038	
		5.5	1,998	
		6.0	1,841	
NPL8-ROW-SB-07-0608	09/11/19	6.5	1,776	2.87
		7.0	1,883	
		7.5	1,911	
		8.0	1,913	
NPL8-ROW-SB-07-0810	09/11/19	8.5	1,858	3.30
		9.0	1,810	
		9.5	1,800	
		10.0	1,912	
NPL8-ROW-SB-07-1012	09/11/19	10.5	1,880	2.89
		11.0	1,889	
		11.5	1,964	
		12.0	1,850	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-08-0002	09/11/19	0.5	1,052	2.12
		1.0	1,455	
		1.5	1,676	
		2.0	1,866	
NPL8-ROW-SB-08-0204	09/11/19	2.5	1,794	1.52
		3.0	1,829	
		3.5	1,853	
		4.0	1,746	
NPL8-ROW-SB-08-0406	09/11/19	4.5	1,933	1.16
		5.0	1,862	
		5.5	1,844	
		6.0	1,820	
NPL8-ROW-SB-08-0608	09/11/19	6.5	1,809	3.56
		7.0	1,813	
		7.5	1,797	
		8.0	1,854	
NPL8-ROW-SB-08-0810	09/11/19	8.5	1,911	3.38
		9.0	1,934	
		9.5	1,950	
		10.0	1,803	
NPL8-ROW-SB-08-1012	09/11/19	10.5	1,769	3.46
		11.0	1,917	
		11.5	1,832	
		12.0	1,921	
NPL8-ROW-SB-09-0002	09/12/19	0.5	948	2.78
		1.0	1,056	
		1.5	1,639	
		2.0	1,712	
NPL8-ROW-SB-09-0204	09/12/19	2.5	1,845	3.10
		3.0	1,881	
		3.5	1,954	
		4.0	1,911	
NPL8-ROW-SB-09-0406	09/12/19	4.5	1,813	3.25
		5.0	1,892	
		5.5	1,997	
		6.0	1,840	
NPL8-ROW-SB-09-0608	09/12/19	6.5	1,850	3.08
		7.0	1,768	
		7.5	1,971	
		8.0	1,949	
NPL8-ROW-SB-09-0810	09/12/19	8.5	1,949	3.11
		9.0	1,938	
		9.5	1,792	
		10.0	1,774	
NPL8-ROW-SB-09-1012	09/12/19	10.5	1,828	3.45
		11.0	1,810	
		11.5	1,856	
		12.0	1,895	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-10-0002	09/12/19	0.5	1,844	**6.90**
		1.0	2,743	
		1.5	**3,782**	
		2.0	**3,914**	
NPL8-ROW-SB-10-0204	09/12/19	2.5	**4,541**	**8.31**
		3.0	**4,229**	
		3.5	**4,350**	
		4.0	**4,291**	
NPL8-ROW-SB-10-0406	09/12/19	4.5	**4,002**	**11.22**
		5.0	**3,842**	
		5.5	**4,175**	
		6.0	**4,407**	
NPL8-ROW-SB-10-0608	09/12/19	6.5	**4,669**	**9.13**
		7.0	**4,528**	
		7.5	**4,200**	
		8.0	**3,700**	
NPL8-ROW-SB-10-0810	09/12/19	8.5	2,591	3.34
		9.0	1,968	
		9.5	1,935	
		10.0	1,958	
NPL8-ROW-SB-10-1012	09/12/19	10.5	1,976	2.74
		11.0	1,853	
		11.5	1,867	
		12.0	1,981	
NPL8-ROW-SB-11-0002	09/12/19	0.5	1,102	2.86
		1.0	1,385	
		1.5	1,777	
		2.0	1,927	
NPL8-ROW-SB-11-0204	09/12/19	2.5	1,920	1.96
		3.0	1,786	
		3.5	1,826	
		4.0	1,762	
NPL8-ROW-SB-11-0406	09/12/19	4.5	1,908	2.43
		5.0	1,727	
		5.5	1,686	
		6.0	1,824	
NPL8-ROW-SB-11-0608	09/12/19	6.5	1,720	1.35
		7.0	1,742	
		7.5	1,743	
		8.0	1,946	
NPL8-ROW-SB-11-0810	09/12/19	8.5	2,019	2.39
		9.0	1,942	
		9.5	1,737	
		10.0	1,786	
NPL8-ROW-SB-11-1012	09/12/19	10.5	1,741	1.84
		11.0	1,739	
		11.5	1,674	
		12.0	1,916	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-12-0002	09/12/19	0.5	1,867	2.38
		1.0	2,016	
		1.5	1,833	
		2.0	1,846	
NPL8-ROW-SB-12-0204	09/12/19	2.5	1,767	1.70
		3.0	1,788	
		3.5	1,839	
		4.0	1,881	
NPL8-ROW-SB-12-0406	09/12/19	4.5	1,949	2.69
		5.0	1,710	
		5.5	1,605	
		6.0	1,865	
NPL8-ROW-SB-12-0608	09/12/19	6.5	1,881	1.69
		7.0	1,956	
		7.5	1,894	
		8.0	1,945	
NPL8-ROW-SB-12-0810	09/12/19	8.5	1,883	1.67
		9.0	2,009	
		9.5	2,036	
		10.0	1,854	
NPL8-ROW-SB-12-1012	09/12/19	10.5	1,957	1.70
		11.0	1,776	
		11.5	1,910	
		12.0	1,871	
NPL8-ROW-SB-13-0002	09/12/19	0.5	1,126	1.17
		1.0	1,300	
		1.5	1,587	
		2.0	1,700	
NPL8-ROW-SB-13-0204	09/12/19	2.5	1,744	2.28
		3.0	1,753	
		3.5	1,834	
		4.0	1,931	
NPL8-ROW-SB-13-0406	09/12/19	4.5	1,845	1.80
		5.0	1,773	
		5.5	1,775	
		6.0	1,774	
NPL8-ROW-SB-13-0608	09/12/19	6.5	1,662	1.35
		7.0	1,639	
		7.5	1,954	
		8.0	1,849	
NPL8-ROW-SB-13-0810	09/12/19	8.5	1,801	2.55
		9.0	1,745	
		9.5	1,290	
		10.0	1,868	
NPL8-ROW-SB-13-1012	09/12/19	10.5	1,862	2.49
		11.0	1,898	
		11.5	1,950	
		12.0	1,845	
		12.5	1,726	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SB-14-0002	09/12/19	0.5	2,002	5.64
		1.0	3,057	
		1.5	**4,432**	
		2.0	**3,302**	
NPL8-ROW-SB-14-0204	09/12/19	2.5	2,766	2.58
		3.0	2,366	
		3.5	2,234	
		4.0	2,135	
NPL8-ROW-SB-14-0406	09/12/19	4.5	2,083	2.64
		5.0	2,051	
		5.5	1,980	
		6.0	1,798	
NPL8-ROW-SB-14-0608	09/12/19	6.5	1,939	1.63
		7.0	1,852	
		7.5	1,685	
		8.0	1,766	
NPL8-ROW-SB-14-0810	09/12/19	8.5	1,956	1.92
		9.0	1,782	
		9.5	1,921	
		10.0	1,860	
NPL8-ROW-SB-14-1012	09/12/19	10.5	1,990	2.18
		11.0	1,765	
		11.5	1,850	
NPL8-ROW-SB-15-0002	09/12/19	0.5	2,013	4.75
		1.0	**3,350**	
		1.5	2,790	
		2.0	2,390	
NPL8-ROW-SB-15-0204	09/12/19	2.5	2,285	2.84
		3.0	2,125	
		3.5	2,240	
		4.0	2,192	
NPL8-ROW-SB-15-0406	09/12/19	4.5	2,160	3.08
		5.0	2,136	
		5.5	2,022	
		6.0	2,097	
NPL8-ROW-SB-15-0608	09/12/19	6.5	2,033	1.96
		7.0	2,009	
		7.5	2,044	
		8.0	2,031	
NPL8-ROW-SB-15-0810	09/12/19	8.5	2,004	2.34
		9.0	1,906	
		9.5	1,929	
		10.0	1,990	
NPL8-ROW-SB-15-1012	09/12/19	10.5	2,112	1.68
		11.0	1,844	
		11.5	1,793	
		12.0	1,773	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SBSO-05-0002 (Step-out soil boring)	09/12/19	0.5	1,037	3.50
		1.0	1,326	
		1.5	1,501	
		2.0	1,583	
NPL8-ROW-SBSO-05-0204 (Step-out soil boring)	09/12/19	2.5	1,599	3.34
		3.0	1,694	
		3.5	1,856	
		4.0	1,853	
NPL8-ROW-SBSO-05-0406 (Step-out soil boring)	09/12/19	4.5	1,650	3.86
		5.0	1,303	
		5.5	1,511	
		6.0	1,557	
NPL8-ROW-SBSO-05-0608 (Step-out soil boring)	09/12/19	6.5	1,757	2.98
		7.0	1,915	
		7.5	1,879	
		8.0	1,831	
NPL8-ROW-SBSO-05-0810 (Step-out soil boring)	09/12/19	8.5	1,758	9.3**
		9.0	1,613	
		9.5	1,486	
		10.0	1,399	
NPL8-ROW-SBSO-05-0810 (2) (Step-out soil boring)	09/19/19	8.5	1,758	3.70
		9.0	1,613	
		9.5	1,486	
		10.0	1,399	
NPL8-ROW-SBSO-05-1012 (Step-out soil boring)	09/12/19	10.5	1,585	2.54
		11.0	1,486	
		11.5	1,591	
		12.0	1,910	
NPL8-ROW-SBSO-06-0002 (Step-out soil boring)	09/12/19	0.5	1,127	2.26
		1.0	1,339	
		1.5	1,587	
		2.0	1,829	
NPL8-ROW-SBSO-06-0204 (Step-out soil boring)	09/12/19	2.5	1,862	3.95
		3.0	1,820	
		3.5	1,898	
		4.0	1,811	
NPL8-ROW-SBSO-06-0406 (Step-out soil boring)	09/12/19	4.5	1,812	2.19
		5.0	1,878	
		5.5	1,966	
		6.0	1,990	
NPL8-ROW-SBSO-06-0608 (Step-out soil boring)	09/12/19	6.5	1,876	4.74
		7.0	1,877	
		7.5	1,932	
		8.0	1,819	
NPL8-ROW-SBSO-06-0810 (Step-out soil boring)	09/12/19	8.5	1,979	3.68
		9.0	1,857	
		9.5	1,969	
		10.0	1,958	
NPL8-ROW-SBSO-06-1012 (Step-out soil boring)	09/12/19	10.5	1,962	4.21
		11.0	1,909	
		11.5	1,951	
		12.0	2,072	

Table 1
Field Gamma Spectroscopy and Down-hole Gamma Survey Results
State Route 71 Right-Of-Way Supplemental Investigation
Ottawa Radiation Areas, OU-4, NPL-8 Frontage Property Site
LaSalle County, Illinois

Sample Number	Sample Collection Date	Depth (bgs feet)	Downhole Gamma Survey (cpm)	Field Gamma Spectroscopy Total Radium Result (pCi/g)*
NPL8-ROW-SBSO-15-0002 (Step-out soil boring)	09/12/19	0.5	1,127	5.40
		1.0	1,339	
		1.5	1,587	
		2.0	1,829	
NPL8-ROW-SBSO-15-0204 (Step-out soil boring)	09/12/19	2.5	1,862	3.28
		3.0	1,820	
		3.5	1,898	
		4.0	1,811	
NPL8-ROW-SBSO-15-0406 (Step-out soil boring)	09/12/19	4.5	1,812	1.82
		5.0	1,878	
		5.5	1,966	
		6.0	1,990	
NPL8-ROW-SBSO-15-0608 (Step-out soil boring)	09/12/19	6.5	1,876	3.25
		7.0	1,877	
		7.5	1,932	
		8.0	1,819	
NPL8-ROW-SBSO-15-0810 (Step-out soil boring)	09/12/19	8.5	1,979	2.65
		9.0	1,857	
		9.5	1,969	
		10.0	1,958	
NPL8-ROW-SBSO-15-1012 (Step-out soil boring)	09/12/19	10.5	1,962	3.98
		11.0	1,909	
		11.5	1,951	
		12.0	2,072	

Notes:

* Samples were collected as composite of each 2 foot interval.

** Gamma analytical results for NPL-8-ROW-SBSO-0500810 were suspected to be anomalous based on the corresponding down-hole gamma results. As a result, the soil sample was re-mixed and five aliquots were sampled and analyzed with the revised results presented as sample NPL-8-ROW-SBSO-0500810 (2).

bgs - below ground surface
cpm - counts per minute
pCi/g - picoCuries per gram

Sample result is above the site-specific radium-226 remedial action objective of 6.2 pCi/g.
Elevated (>3,072 counts per minute) down-hole gamma result was observed in the depth interval.

APPENDIX A

DOWN-HOLE GAMMA LOGGING RESULTS

4 foot

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: _____ Boring ID: SB-01

Name: Andre Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	2113
1'	2063
1.5'	1945
2'	1759
2.5'	1744
3'	1781
3.5'	1854
4'	1578
4.5'	
5'	
5.5'	
6'	
6.5'	
7	
7.5'	

Detector Location BGS	CPM
8'	
8.5'	
9'	
9.5'	
10'	
10.5'	
11'	
11.5'	
12'	
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL8 Fueling Row Boring ID: ~~GA~~ 02

Name: Glen Hole Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1152
1'	1447
1.5'	1469
2'	1611
2.5'	1600
3'	1447
3.5'	1859
4'	1940
4.5'	1911
5'	1976
5.5'	1770
6'	1760
6.5'	1623
7	1611
7.5'	1784

Detector Location BGS	CPM
8'	2030
8.5'	2140
9'	1956
9.5'	1784
10'	1602
10.5'	1474
11'	
11.5'	
12'	
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPES Fantasy Row Boring ID: 03

Name: Stan Huber Date: 4/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☒ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	2777
1'	2288
1.5'	2105
2'	1960
2.5'	1654
3'	1750
3.5'	1608
4'	2011
4.5'	1942
5'	2001
5.5'	2057
6'	2053
6.5'	2033
7	2041
7.5'	

Detector Location BGS	CPM
8'	
8.5'	
9'	
9.5'	
10'	
10.5'	
11'	
11.5'	
12'	
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NRC8 Frontage Rd. Boring ID: 04

Name: Glen Huber Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1093
1'	1193
1.5'	1280
2'	1425
2.5'	1476
3'	1519
3.5'	1591
4'	1735
4.5'	1890
5'	1847
5.5'	1859
6'	1812
6.5'	1689
7	2052
7.5'	1894

Detector Location BGS	CPM
8'	1663
8.5'	1805
9'	1807
9.5'	1804
10'	1737
10.5'	1896
11'	1835
11.5'	1855
12'	1358
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: _____ Boring ID: 05

Name: Glen Huber Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1691
1'	2770
1.5'	3885
2'	2697
2.5'	2258
3'	2198
3.5'	2182
4'	2079
4.5'	2172
5'	2137
5.5'	2075
6'	1997
6.5'	1934
7	2084
7.5'	2070

Detector Location BGS	CPM
8'	2063
8.5'	2126
9'	2055
9.5'	2146
10'	2110
10.5'	2184
11'	2074
11.5'	
12'	
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL8 Frontage Road Boring ID: 06

Name: Glen Huber Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☒ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1915
1'	3279
1.5'	2775
2'	2139
2.5'	2066
3'	2104
3.5'	2174
4'	2127
4.5'	2051
5'	1828
5.5'	1827
6'	1857
6.5'	1829
7	1855
7.5'	1946

Detector Location BGS	CPM
8'	1983
8.5'	1993
9'	2071
9.5'	2014
10'	1844
10.5'	1757
11'	1906
11.5'	1878
12'	1931
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____

sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NRL8 Frontage Row Boring ID: 07

Name: Glenn Huber Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☑ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1075
1'	1412
1.5'	2118
2'	3280
2.5'	2896
3'	2366
3.5'	2048
4'	2007
4.5'	1966
5'	2038
5.5'	1998
6'	1841
6.5'	1776
7	1883
7.5'	1911

Detector Location BGS	CPM
8'	1913
8.5'	1858
9'	1810
9.5'	1800
10'	1912
10.5'	1880
11'	1889
11.5'	1964
12'	1850
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL & Former ROW Boring ID: 08

Name: Glen Huber Date: 9/11/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☒ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1052
1'	1455
1.5'	1676
2'	1866
2.5'	1794
3'	1829
3.5'	1853
4'	1746
4.5'	1933
5'	1862
5.5'	1844
6'	1820
6.5'	1809
7	1813
7.5'	1797

Detector Location BGS	CPM
8'	1854
8.5'	1911
9'	1934
9.5'	1950
10'	1803
10.5'	1769
11'	1917
11.5'	1832
12'	1921
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sohci

Comments:

12 inch Auger
12 foot Boring

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL8 Boring ID: SB09

Name: Andre Burke Date: 9/12/19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	948
1'	1056
1.5'	1639
2'	1712
2.5'	1845
3'	1881
3.5'	1954
4'	1911
4.5'	1813
5'	1892
5.5'	1947
6'	1840
6.5'	1850
7	1768
7.5'	1971

Detector Location BGS	CPM
8'	1949
8.5'	1949
9'	1938
9.5'	1792
10'	1779
10.5'	1828
11'	1810
11.5'	1856
12'	1895
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature

sahci

Comments:

12 Boot

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL 8 Boring ID: SB-10

Name: Andri Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1844
1'	2743
1.5'	3782
2'	3914
2.5'	4541
3'	4229
3.5'	4350
4'	4291
4.5'	4002
5'	3842
5.5'	4175
6'	4407
6.5'	4669
7	4528
7.5'	4200

Detector Location BGS	CPM
8'	3700
8.5'	2591
9'	1962
9.5'	1955
10'	1958
10.5'	1976
11'	1853
11.5'	1867
12'	1981
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

12 Foot

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL 8 Boring ID: SB-11

Name: André Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1102
1'	1385
1.5'	1777
2'	1927
2.5'	1920
3'	1786
3.5'	1826
4'	1762
4.5'	1908
5'	1727
5.5'	1686
6'	1824
6.5'	1720
7	1742
7.5'	1743

Detector Location BGS	CPM
8'	1946
8.5'	2019
9'	1942
9.5'	1737
10'	1786
10.5'	1741
11'	1739
11.5'	1674
12'	1916
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL 8 Boring ID: ~~SB-12~~ SB-12

Name: André Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1867
1'	2016
1.5'	1833
2'	1846
2.5'	1767
3'	1788
3.5'	1829
4'	1881
4.5'	1949
5'	1710
5.5'	1605
6'	1865
6.5'	1881
7	1956
7.5'	1874

Detector Location BGS	CPM
8'	1945
8.5'	1883
9'	2009
9.5'	2036
10'	1854
10.5'	1957
11'	1776
11.5'	1910
12'	1871
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL 8 Boring ID: SB-13

Name: André Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1126
1'	1300
1.5'	1587
2'	1700
2.5'	1744
3'	1753
3.5'	1834
4'	1931
4.5'	1845
5'	1773
5.5'	1775
6'	1774
6.5'	1662
7	1639
7.5'	1954

Detector Location BGS	CPM
8'	1849
8.5'	1801
9'	1745
9.5'	1790
10'	1868
10.5'	1862
11'	1898
11.5'	1950
12'	1845
12.5'	1726
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL8 Boring ID: SB-14

Name: Andre Baker Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	2102
1'	3087
1.5'	4432
2'	3302
2.5'	2766
3'	2366
3.5'	2234
4'	2135
4.5'	2083
5'	2051
5.5'	1980
6'	1798
6.5'	1939
7	1852
7.5'	1685

Detector Location BGS	CPM
8'	1766
8.5'	1956
9'	1782
9.5'	1921
10'	1800
10.5'	1990
11'	1765
11.5'	1850
12'	
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL Boring ID: SB-15

Name: André Burke Date: 9-12-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	2013
1'	3350
1.5'	2790
2'	2390
2.5'	2285
3'	2125
3.5'	2240
4'	2198
4.5'	2160
5'	2136
5.5'	2022
6'	2697
6.5'	2033
7	2009
7.5'	2044

Detector Location BGS	CPM
8'	2021
8.5'	2004
9'	1906
9.5'	1929
10'	1990
10.5'	210
11'	1844
11.5'	1793
12'	1773
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature _____ sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL-8 Boring ID: SB05-S01

Name: Michal Tuska Date: 9-13-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1037
1'	1326
1.5'	1501
2'	1583
2.5'	1599
3'	1694
3.5'	1856
4'	1853
4.5'	1650
5'	1303
5.5'	1511
6'	1557
6.5'	1757
7	1915
7.5'	1879

Detector Location BGS	CPM
8'	1831
8.5'	1758
9'	~~1758~~ 1613
9.5'	1486
10'	1399
10.5'	1585
11'	1486
11.5'	1591
12'	1910
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature Michal Tuska

sahci

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: NPL-8 Boring ID: SB06-S01

Name: Michael Jutka Date: 9-13-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1127
1'	1339
1.5'	1587
2'	1829
2.5'	1862
3'	1820
3.5'	1898
4'	1811
4.5'	1812
5'	1878
5.5'	1966
6'	1990
6.5'	1876
7	1877
7.5'	1932

Detector Location BGS	CPM
8'	1819
8.5'	1979
9'	1857
9.5'	1969
10'	1958
10.5'	1962
11'	1909
11.5'	1951
12'	2072
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature Michael Jutka

Comments:

Downhole Gamma Log

Stan A. Huber Consultants, Inc.

Project ID: ~~SB15~~ NPL-8 Boring ID: SB15-S01

Name: Michal Tutka Date: 9-13-19

Instrument ID: ☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR294074) w/ 25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3401 CPM (CAL Date 12-11-18)

☐ Ludlum Model 2221 (Serial No. 127242) w/ Model 44-62 (Serial No. PR129795) w/25' "C" Cable - unshielded
7.1 pCi/g Thorium = 3308 CPM (CAL Date 12-11-18)

Detector Location BGS	CPM
0.5'	1735
1'	2333
1.5'	2190
2'	2103
2.5'	1868
3'	1925
3.5'	2035
4'	1912
4.5'	1921
5'	1812
5.5'	1870
6'	1953
6.5'	2018
7	1957
7.5'	1930

Detector Location BGS	CPM
8'	1822
8.5'	1983
9'	1895
9.5'	1938
10'	1789
10.5'	1928
11'	2009
11.5'	1925
12'	1895
12.5'	
13'	
13.5'	
14'	
14.5	
15'	

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature Michal Tutka

sahci

Comments:

APPENDIX B

SOIL BORING LOGS

BORING NUMBER SB-01

Tetra Tech
1 S Wacker Drive, 37th Floor
Chicago, IL 60606

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Hand Auger
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Hand augered at 8' within an excavation
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5					
10		100	CL		(CL) Gray + brown clay, small gravel, moist
10.0		100	CL		(CL) Brown + gray clay, moist
12.0					Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-02

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Refusal at 10.5 ft
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			CL-ML		0.5 (CL-ML) Dark brown organics, gray + light brown mottled silty clay with gravel
		100	CL-ML		(CL-ML) Gray + light brown mottled silty clay with gravel
					4.0
5		70	CL-ML		(CL-ML) Brown mottled silty clay, light gray gravel
					6.0
			CL-ML		(CL-ML) Light gray silty clay with gravel
					7.0
			CL-ML		(CL-ML) Reddish brown + gray mottled silty clay, with gravel, low plasticity
					8.0
10		50	CL-ML		(CL-ML) Light gray silty clay, low plasticity, gravel, moist at bottom
					10.5

Bottom of borehole at 10.5 feet.

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BORING NUMBER SB-03

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Began 2' within an excavation, refusal at ~9 ft
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			CL-ML		(CL-ML) Dark gray silty clay with tan gravel
		100			
4.5					
5			CL-ML		(CL-ML) Gray + brown mottled silty clay with tan gravel
6.0					
6.5			CL-ML		(CL-ML) Gray silty clay with tan gravel
		100	CL-ML		(CL-ML) Light gray + light brown mottled silty clay wih tan gravel
9.0					

Bottom of borehole at 9.0 feet.

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BORING NUMBER SB-04

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown organics with silt
					1.0 Dark brown organics
		100	CL-ML		(CL-ML) Light gray + light brown mottled silty clay with gravel
5		100			6.0
			MLS		6.5 (MLS) Brown sandy silt with gravel
			CL-ML		(CL-ML) Gray silty clay, tan gravel
					8.0
		40	CL-ML		(CL-ML) Gray silty clay, low plasticity
10					10.0
			CL-ML		(CL-ML) Light brown + gray mottled silty clay
					12.0

Bottom of borehole at 12.0 feet.

BORING NUMBER SB-05

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CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Began 1.5' within an excavation, refusal at 12.9'
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			CL-ML		(CL-ML) Grayish brown silty clay with tan gravel
2.5					
3.0		100	CL-ML		(CL-ML) Grayish brown sandy silty clay
			CL-ML		(CL-ML) Gray silty clay with tan gravel
5					
5.5		100	CL-ML		(CL-ML) Gray sandy silty clay
8.0			CL-ML		(CL-ML) Gray + light brown mottled sily clay, tan gravel, low plasticity
9.5					
10		60	CL-ML		(CL-ML) Brown silty clay with trace gravel, low plasticity
12.9					

Bottom of borehole at 12.9 feet.

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BORING NUMBER SB-05-S01

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/13/19 **COMPLETED** 9/13/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown organics
			CL-ML		1.0 (CL-ML) Dark brown silty clay with organics
		91	CL-ML		(CL-ML) Gray + light brown mottled silty clay with some sand and gravel
			CL-ML		3.0 (CL-ML) Gray silty clay with trace gravel, low plasticity
5					5.0
		60	ML		(ML) Brownish gray sandy silt with gravel, medium plasticity
					8.0
			CL-ML		(CL-ML) Gray + brown mottled silty clay with trace gravel, low plasticity
10		75			10.0
			CL-ML		(CL-ML) Gray silty clay with trace gravel, low plasticity
					12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-06

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geprobe
AT TIME OF DRILLING ---
LOGGED BY WG **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SP		(SP) Brown sand wth organics, trace gravel
				1.0	
			SP		(SP) Brown sand and gravel, trace silt
		100		2.0	
			SP-SM		(SP-SM) Grayish brown sand, little silt
				4.0	
5			SP-SM		(SP-SM) Brownish gray sand and silt, trace gravel
		100		6.0	
			ML		(ML) Brownish gray sandy silt, low plasticity
10		40			
				12.0	

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-06-S01

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/13/19 **COMPLETED** 9/13/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown silty organics
			CL-ML		1.0 (CL-ML) Brown silty clay with organics
		95	CL-ML		(CL-ML) Gray + light brown mottled silty clay with gravel and some sand
					4.0
5			CL-ML		5.0 (CL-ML) Brownish gray silty clay with trace gravel, low plasticity
			CL-ML		(CL-ML) Gray + brown mottled silty clay, low plasticity, small rocks
					7.0
		75	CL		(CL) Gray + brown clay, moist, small rocks at 10-12'
10					
		100			12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-07

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY WG **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SP		(SP) Brown sand and organics, trace silt
				1.0	
		100	SP		(SP) Brown sand, little silt, trace gravel and bick
				4.0	
5		100	ML		(ML) Brownish gray sandy silt, low plasticity, trace gravel
				8.0	
			ML		(ML) Brown sandy silt, compacted clay, low plasticity, trace gravel
				9.0	
10		75	CL-ML		(CL-ML) Gray + brown mottled silty clay with gravel
				10.0	
			CL-ML		(CL-ML) Gray silty clay, low plasticity
				12.0	

Bottom of borehole at 12.0 feet.

BORING NUMBER SB-08

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CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/11/19 **COMPLETED** 9/11/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Dark brown organics
		100	CL-ML		(CL-ML) Gray + light gray mottled silty clay + gravel
					2.0
			CL-ML		(CL-ML) Gray + brown mottled silty clay with gravel
					4.0
5		40	CL-ML		(CL-ML) Mottled silty clay with fine gravel
					6.0
			CL-ML		(CL-ML) Mottled silty clay, brown gravel
					7.0
					(CL-ML) Gray + brown mottled silty clay
10		50	CL-ML		
					12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-09

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
					0.5 Dark brown organics with trace gravel
			SP-SM		1.0 (SP-SM) Brown silty sand with trace gravel
		100	CL-ML		2.0 (CL-ML) Gray + brown mottled silty clay with trace gravel
			CL-ML		(CL-ML) Gray + brown mottled silty clay with trace reddish-brown gravel
					4.0
5			CL-ML		5.0 (CL-ML) Gray sandy silty clay with trace gravel
		100	CL-ML		(CL-ML) Gray + light brown mottled silty clay, low-medium plasticity, with trace gravel
					8.0
			CL-ML		9.0 (CL-ML) Light gray silty clay, low plasticity
10		55	CL-ML		10.0 (CL-ML) Light gray + brown mottled silty clay, medium plasticity, trace gravel + sand, moist
			CL-ML		(CL-ML) Gray silty clay, compacted, low plasticity
					12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-10

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown organics with trace gravel
		100	CL-ML		(CL-ML) Brown + gray mottled silty clay with some gravel
					3.0
			CL-ML		(CL-ML) Gray sandy silty clay with some gravel
					4.0
5			CL-ML		(CL-ML) Gray + light brown mottled silty clay with some gravel
		100			5.5
			CL-ML		(CL-ML) Gray silty clay with tan gravel, low-medium plasticity
					9.0
10		30	CL-ML		(CL-ML) Gray + light brown mottled silty clay, low plasticity, compacted
					12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-11

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Dark brown organics
				1.0	
			CL-ML		(CL-ML) Gray silty clay with trace gravel
		100		2.0	
			CL-ML		(CL-ML) Gray brown mottled silty clay with some sand + gravel
5				5.0	
			CL-ML		(CL-ML) Brown silty clay with trace gravel, low plasticity
		75		6.0	
			CL-ML		(CL-ML) Gray silty clay with gravel, low-medium plasticity
10		40		11.0	
			CL-ML		(CL-ML) Gray silty clay, compacted, low plasticity
				12.0	

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-12

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown organics
		100	CL-ML		(CL-ML) Gray + light brown mottled silty clay with trace gravel
					2.0
			ML		2.5 (ML) Light brown sandy silt with gravel
					(CL-ML) Gray + light brown mottled silty clay with trace gravel, low-medium plasticity
5		65	CL-ML		
10		60			11.0
			CL-ML		12.0 (CL-ML) Gray silty clay, compacted, low plasticity

Bottom of borehole at 12.0 feet.

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Chicago, IL 60606

BORING NUMBER SB-13

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY PP **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Dark brown organics
			CL-ML		1.5 (CL-ML) Gray silty clay with trace gravel
		100	ML		(ML) Light brown sandy silt with trace gravel
			CL-ML		3.0 (CL-ML) Gray silty clay with trace gravel
5		80	CL-ML		4.0 (CL-ML) Gray + light brown mottled silty clay with some gravel
10		40			12.0

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-14

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY WG **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
0					1.0	Brown organics, trace gravel
		100	ML		3.0	(ML) Brown sandy silt with trace gravel
5		100	CL		6.0	(CL) Hardened gray clay with little sand, trace gravels, low plasticity
			CL		8.0	(CL) Mottled brownish-gray clay, little silt, trace gravel
10		40	CL-ML		11.0	(CL-ML) Gray silt and clay, trace gravel
			CL-ML		12.0	(CL-ML) Mottled brownish-gray clay, little silt, trace gravel

Bottom of borehole at 12.0 feet.

BORING NUMBER SB-15

Tetra Tech
1 S Wacker Drive, 37th Floor
Chicago, IL 60606

CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/12/19 **COMPLETED** 9/12/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY WG **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					0.5 Brown organics, little sand and silt
		100	SP		(SP) Brown sand, little silt, trace gravel and clay
					3.0
			SP		(SP) Mottled brownish gray sand and silt, little clay
					4.0
5		100	ML		(ML) Mottled brownish gray silt, little clay, trace gravel
					8.0
10		90	ML		(ML) Brownish gray silt, little hardened clay, low plasticity
					12.0

Bottom of borehole at 12.0 feet.

BORING NUMBER SB15-S01

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CLIENT Environmental Protection Agency
PROJECT NAME NPL-8 ROW
PROJECT NUMBER 103G1852334
PROJECT LOCATION Ottawa, IL
DATE STARTED 9/13/19 **COMPLETED** 9/13/19
GROUND ELEVATION _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING ---
LOGGED BY AB **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		100			Organics, small brown cinders mixed in at ~6", some clay
					2.5
			CL-ML		(CL-ML) Tan + gray silty clay, some cinders mixed in at ~4'
5					5.0
		80	CL		(CL) Gray + brown mottled clay
10					
		75			
					12.5

Bottom of borehole at 12.5 feet.